

# THE FEASIBILITY OF CONTRACTING FOR ELEVATION DATA AT APFO

---

**APFO Elevation Team**

**USDA Planning Meeting December 6-8, 2011**



# Outline

---

- Introduction
- Project Objectives
- Project Approach
- Elevation Contracting Scenario 1
- Elevation Contracting Scenario 2
- Elevation Contracting Scenario 3
- Assessing Risk
- Major Findings
- Requirements Summary
- Conclusion



# Introduction

---

- The opportunity for APFO to contract for elevation data grows out of the need to serve USDA customers
- There is a gap in services for acquiring elevation data
- The Forest Service, Natural Resource Conservation Service (NRCS) and others have inquired about the possibility of APFO contracting for elevation data
- APFO conducted an elevation feasibility study
- There is widespread interest in elevation data throughout the government



# Project Objectives

---

- Assess the feasibility of APFO contracting for, receiving, inspecting, ingesting, archiving, and distributing elevation data
- Gain an understanding of elevation acquisition methods
- Gain an understanding of elevation delivery formats
- Assess the technical feasibility of cradle to grave elevation acquisition and delivery
- Assess costs, benefits and risks



# Project Approach

---

- The project was approached by analyzing three elevation contracting scenarios of varying complexity.
- The scenarios are each made up of associated activities depending on the complexity of the scenario
  - **Contracting** – planning, writing the contract, specifications and statement of work, coordination with end customer, carrying out contract to end
  - **Receiving** – deliverables received, status and progress reports, and verification processes run
  - **Ingestion** – data is made accessible on APFO network
  - **Cataloguing** – manages and organizes spatial data allowing access to the data



# Project Approach

---

- **Third Party Inspection** – outside party will review deliverables to contract specifications and provide reports to APFO and end customer
- **In House Inspection** – APFO reviews deliverables to contract specifications and provides reports to the end customer
- **Archiving** – The level and need of archiving the data would be determined on a project by project basis and the datasets would be archived using industry standards
- **Delivery** – End customer receives all deliverables by APFO shipping media or media-less delivery such as secure FTP
- **Distribution** – Would occur last in the process on a project by project basis and would allow the APFO Customer Service Section to offer data to the public and other Government agencies similar to distributing other datasets such as NAIP, which includes digital media and web applications



# Elevation Contracting Scenario 1

---

- Scenario 1 is the most basic scenario
- Activities – Contract, Receive, and Deliver
- Lowest risk to APFO but places the burden of inspection and quality assurance onto the end customer
- Product deliverables would be considered as a pass-through product meaning APFO would not ingest, catalogue, archive, inspect or distribute the elevation dataset
- APFO could request a copy of the dataset even though it would not formally be archived



# Elevation Contracting Scenario 2

---

- Scenario 2 is a mid range scenario
- Activities – Contract, Receive, Ingest & Catalog, Inspect, and Deliver
- Builds on Scenario 1 by including the quality assurance requirements as an APFO responsibility which cuts risk to the customer
- This shift will require APFO to increase resource allocation including inspection personnel and the acquisition of notable IT hardware, programming, and software assets
- Under this scenario APFO would not distribute or archive the elevation datasets



# Elevation Contracting Scenario 3

---

- Scenario 3 is an advanced option
- Activities – Contract, Receive, Ingest & Catalog, 3<sup>rd</sup> Party Inspect, Archive, Deliver, and Distribute
- Advanced scenario introduces complexity into the process through third party inspection, archiving, and distribution
- Third party inspection is a common practice
  - Would reduce APFO's manpower and resource requirements
  - Adds complexity by requiring an extra contract to be written and administered
  - APFO would have to coordinate between inspection contractor and end user



# Elevation Contracting Scenario 3

---

- The ingestion will be different from scenario 2 as it will be done after the acceptance of the data and is intended to support the cataloguing versus the temporary storage that in-house inspection requires
- Archiving and distribution will also add complexity to the process and will require significant storage and network resources
- Scenario 3 would require significant lead time to gather the appropriate resources, manpower, and training



# Assessing Risk

---

- Each Scenario previously explained comes with a certain amount of risk to APFO in implementation and sustainment of the processes associated with it
- The following stoplight chart is a general risk table which assesses the level of risk for implementation of particular activities associated with each scenario
- The risk is measured based on whether the task is achievable or not if **no additional IT or organizational infrastructure, training, or personnel are provided to accomplish the work**



# Stoplight Risk Chart

Activity	Resources	Initial Implementation			Sustainment		
		Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Contract	Infrastructure						
	Training						
	Personnel						
Receive	Infrastructure						
	Training						
	Personnel						
Ingest	Infrastructure	N/A					
	Training	N/A					
	Personnel	N/A					
Inspect	Infrastructure	N/A			N/A		
	Training	N/A			N/A		
	Personnel	N/A			N/A		
Deliver	Infrastructure						
	Training						
	Personnel						
Archive	Infrastructure	N/A	N/A		N/A	N/A	
	Training	N/A	N/A		N/A	N/A	
	Personnel	N/A	N/A		N/A	N/A	
Distribute	Infrastructure	N/A	N/A		N/A	N/A	
	Training	N/A	N/A		N/A	N/A	
	Personnel	N/A	N/A		N/A	N/A	

	minimal risk to current APFO programs and operations
	moderate risk to current APFO programs and operations
	high risk to current APFO programs and operations

# Major Findings

---

- APFO should consider contracting for elevation data
- APFO could better serve customers if the capability existed to contract for elevation data
- No change to the organizational structure is required
- APFO would need to hire at least 1-3 FTEs to adequately support Scenarios 2 and 3
- APFO currently does not have the necessary expertise in-house to support contracting for and handling elevation data
- Training would be required to develop in-house technical expertise



# Major Findings

---

- If adequate technical expertise and infrastructure are not in place elevation data may be delivered with no way of inspecting or ingesting the data causing delays to the customer
- IT infrastructure and storage capacity will require significant upgrades to properly process and store elevation data for Scenarios 2 and 3
- APFO would need at least 12 months to prepare to contract for elevation data if the required personnel were already in place
- Validation scripts and inspection tools will need to be created by IT personnel for Scenarios 2 and 3



# Requirements Summary

---

- The following table provides a summary of estimated requirements to implement scenarios 1, 2, and 3
- The summary includes:
  - FTE Requirements
  - Training
  - Contract Development
  - Procedural development
  - QA requirements
  - It support including costs and time



# Requirements Summary Table

Estimated Requirements	Scenario 1	Scenario 2	Scenario 3
FTEs new hires required	0-1 FTEs	1-3 FTEs	1-3 FTEs
FTEs in-house required	1-2 FTEs	2-4 FTEs	2-4 FTEs
Skill set training	12 months	12 months	12 months
Project duration per FTE	1-2 months	2-12 months	2-6 months
Contract development	4 months	4 months	4 months
QA Contract development	N/A	N/A	4 months
IT support/scripts	4 months	4 months	4 months
IT support/database design	4 months	4 months	4 months
IT support/ingestion procedures	N/A	4 months	4 months

# Requirements Summary Table

Estimated Requirements	Scenario 1	Scenario 2	Scenario 3
IT support/distribution procedures	N/A	N/A	4 months
IT support/QA application development	N/A	4-6 months	N/A
IT support/software upgrades installation using in-house software	N/A	2-3 weeks	2-3 weeks
IT support/new software LIDAR specific	N/A	\$0-15K per seat	N/A
IT infrastructure costs/servers/storage	\$10K-30K	\$200K	\$200K-400K
IT desktop production workstations	N/A	\$5K-35K	\$5K-35K
QA inspection requirement	N/A	2 months	2 months
QA initial procedures	N/A	2 months	N/A
QA inspection procedures	N/A	4 months	N/A



# Conclusion

---

- Contracting for elevation data is a unique opportunity for APFO
- APFO could fill an existing need and establish itself as a technical authority on data which can help support imagery programs such as NAIP and Resource Photography
- Contracting for, receiving, ingesting, inspecting, archiving, and distributing elevation data is feasible, but requires the correct technical knowledge, a certain level of dedicated staffing, infrastructure and a comprehensive understanding of the end customer's requirements

